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**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

Application Number: 09/779,560
Filing Date: February 09, 2001
Appellant(s): HARBOE, MARIANNE

Jeff B. Vockrodt
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed on 11/02/07 appealing from the Office action mailed on 12/11/06.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The examiner substantially agrees with the appellant's summary of claimed subject matter with the exception of the characterization of the experimental results of Table 2.1 of the specification and Figure 1 of the drawing figures as being "unexpected results". According to appellant, "lowering the pH to a specified range, glucoamylase side activity is unexpectedly reduced while chymosin activity is maintained in significant quantities". Brief at p. 4, lines 6-8. For reasons set forth below, it is the examiner's position that appellant has failed to establish that the results of Table 2.1 of the specification and Figure 1 of the drawing figures are unexpected. See particularly the response to appellant's argument addressing the rejection under 35 U.S.C. 103(a).

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**GROUNDS OF REJECTION NOT ON REVIEW**

The following grounds of rejection have not been withdrawn by the examiner, but they are not under review on appeal because they have not been presented for review in the appellant's brief.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 17 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which appellant regards as the invention.

Claim 17 depends from claim 9, which has been amended to require a pH in the range of 1.0 to 1.8. Claim 17 is confusing and lacks antecedent basis in the recitation of "pH in the range of 1.0 to 1.99" as the recited pH range in claim 17 is broader than the claim from which it depends. It is suggested that appellant clarify the meaning of the claim.

MPEP 1205.02 states, "An appellant's brief must be responsive to every ground of rejection stated by the examiner that the appellant is presenting for review in the appeal. If a ground of rejection stated by the examiner is not addressed in the appellant's brief, that ground of rejection will be summarily sustained by the Board". In the appeal brief filed on 11/2/07, appellant does not appear to respond to the above

rejection under 35 U.S.C. 112, second paragraph. Thus, it appears that appellant concedes the propriety of the rejection.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

1) Lawlis, Jr. et al., US Patent 5,801,034, September 1998; cited in the PTO-892 filed on 12/11/06

2) Ward et al., *Biotechnol* 8:435-440, 1990; cited in the IDS filed on 4/16/01

3) Branden et al., "Introduction to Protein Structure", Garland Publishing Inc., New York, 1991; cited in the PTO-892 filed on 3/18/2005

4) Witkowski et al., *Biochemistry* 38:11643-11650, 1999; cited in the PTO-892 filed on 3/18/2005

5) Foltmann, *Biochem J.* 115:3P-4P, 1969; cited in the PTO-892 filed on 5/31/06

6) Larsen, WO 95/29999; cited in the IDS filed on 4/16/01

7) Lausten, US Patent 6,080,564, June 2000; cited in the PTO-892 filed on 4/9/02

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Rejections under 35 U.S.C. 112, first paragraph

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

A. Written Description

Claims 5-6, 9-14, 16-18, 35-36, 39, and 42-43 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This is a written description rejection.

According to MPEP 2163.II.A.1, in evaluating a claimed invention for adequate written description, the examiner should determine what the claim as a whole covers. "Claim construction is an essential part of the examination process. Each claim must be separately analyzed and given its broadest reasonable interpretation in light of and consistent with the written description. See, e.g., *In re Morris*, 127 F.3d 1048, 1053-54, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997)."

The claims are drawn to a method using a medium that comprises chymosin activity and glucoamylase activity derived from the cultivation of an organism selected from a bacterial species, a yeast species, or a species of filamentous fungi, wherein the organism comprises a genus of genes for encoding chymosin that is derived from a bovine or *Camelidae* species. Claim 39 limits the *Camelidae* species to *Camelus dromedarius.*

According to the specification, the claimed method can be applied to "a medium that is derived from the cultivation of a recombinant microorganism that has an inserted

gene expressing the aspartic protease" (paragraph bridging pp. 7-8), that the claimed method is applicable to "preparations of aspartic proteases derived from naturally produced aspartic protease by addition or deletion of one or more amino acids or substituting one or more amino acids herein" (specification at p. 8, lines 32-35) and states that the term "aspartic protease" includes pro-chymosin and chymosin (p. 8, line 24). The term "derived" has been interpreted in light of the specification (p. 8, lines 32-35) as modified from an original source. As such, the phrase "a gene for encoding chymosin that is derived from a bovine or *Camelidae* species" has been broadly, but reasonably interpreted in light of the specification as meaning a nucleic acid encoding naturally-occurring bovine and *Camelidae* species chymosin as well as mutant and variant forms thereof, wherein the mutant and variant forms are unlimited with respect to structure. This interpretation appears to be undisputed by appellant. Also, it is noted that the genus *Camelidae* is not limited to any one species, but encompasses alpaca, llama, vicunas, guanacos, bactrian camel and dromedarian camel.

For claims drawn to a genus, MPEP § 2163 states the written description requirement for a genus may be satisfied through sufficient description of a representative number of species by actual reduction to practice, reduction to drawings, or by disclosure of relevant, identifying characteristics, i.e., structure or other physical and/or chemical properties, by functional characteristics coupled with a known or disclosed correlation between function and structure, or by a combination of such identifying characteristics, sufficient to show the applicant was in possession of the claimed genus. MPEP § 2163 states that a representative number of species means

that the species which are adequately described are representative of the entire genus. Thus, when there is substantial variation within the genus, one must describe a sufficient variety of species to reflect the variation within the genus. In this case, the specification discloses only a single representative species of the recited genus of genes that encodes a polypeptide with the recited functional characteristic of maintaining at least 75% chymosin activity at a pH of 1.0 to 1.8, i.e., a gene encoding bovine chymosin. Other than this single species, the specification fails to disclose other representative species of the genus of recited genes. In this case, the genus of genes encoding any chymosin polypeptide encompasses widely variant species, including genes encoding naturally occurring bovine or *Camelidae* species chymosin and any mutants and variants thereof as noted above. The disclosure of the single representative species as noted above fails to reflect the variation among the members of the genus.

Regarding the genus of recited *Camelidae* species chymosin genes, it is noted that while the original claim 29 recites *Camelidae* species, including *Camelus dromedarius* (see also specification at p. 8, lines 28-29), the specification in combination with the prior art nonetheless fail to adequately describe the recited genus of genes encoding a *Camelidae* chymosin. In this case, the recitation of "a gene for encoding chymosin that is derived from a...*Camelidae* species" fails to provide a sufficient description of the claimed genus of *Camelidae* species chymosin genes as it merely describes the functional features of the genus without providing any definition of the structural features of the species within the genus. The Court in University of California

v. Eli Lilly and Co., 43 USPQ2d 1398 (Fed. Cir. 1997) stated that: "In claims to genetic material, however a generic statement such as "vertebrate insulin cDNA" or "mammalian insulin cDNA", without more, is not an adequate written description of the genus because it does not distinguish the claimed genus from others, except by function. It does not specifically define any of the genes that fall within its definition. It does not define any structural features commonly possessed by members of the genus that distinguish them from others. One skilled in the art therefore cannot, as one can do with a fully described genus, visualize or recognize the identity of the members of the genus". Similarly with the claimed genus of *Camelidae* species chymosin genes, the functional definition of the genus does not provide any structural information commonly possessed by members of the genus which distinguish the species within the genus from other genes such that one can visualize or recognize the identity of the members of the genus.

According to MPEP 2163.I, "[t]o satisfy the written description requirement, a patent specification must describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention" (citation omitted) and "[p]ossession may be shown in a variety of ways including description of an actual reduction to practice, or by showing that the invention was 'ready for patenting' such as by the disclosure of drawings or structural chemical formulas that show that the invention was complete, or by describing distinguishing identifying characteristics sufficient to show that the applicant was in possession of the claimed invention" (citation omitted). In this case, other than

describing the genus of genes encoding a *Camelidae* species chymosin by mere functional features, the specification and prior art fail to disclose any distinguishing identifying characteristics of a gene encoding a *Camelidae* species chymosin, *e.g.,* the nucleotide sequence of a gene encoding a *Camelidae* species chymosin, or a method for obtaining such gene. According to MPEP 2163.II.A.3.(a).i), "'A gene is a chemical compound, albeit a complex one, and it is well established in our law that conception of a chemical compound requires that the inventor be able to define it so as to distinguish it from other materials, and to describe how to obtain it. Conception does not occur unless one has a mental picture of the structure of the chemical, or is able to define it by its method of preparation, its physical or chemical properties, or whatever characteristics sufficiently distinguish it. It is not sufficient to define it solely by its principal biological property, e.g., encoding human erythropoietin, because an alleged conception having no more specificity than that is simply a wish to know the identity of any material with that biological property. We hold that when an inventor is unable to envision the detailed constitution of a gene so as to distinguish it from other materials, as well as a method for obtaining it, conception has not been achieved until reduction to practice has occurred, i.e., until after the gene has been isolated.'" MPEP 2163.I.A states, "[a] biomolecule sequence described only by a functional characteristic, without any known or disclosed correlation between that function and the structure of the sequence, normally is not a sufficient identifying characteristic for written description purposes." See also *Ex Parte Kubin* 83 USPQ2d 1410 (Bd. Pat. App. & Int. 2007), wherein it was held that "Without a correlation between structure and function, the claim

does little more than define the claimed invention by function. That is not sufficient to satisfy the written description requirement. *See Eli Lilly*, 119 F.3d at 1568, 43 USPQ2d at 1406 ('definition by function ... does not suffice to define the genus because it is only an indication of what the gene does, rather than what it is')." In this case, there appears to be no known or disclosed correlation between the function of any *Camelidae* species, including *Camelus dromedarius,* chymosin gene and its structure such that a skilled artisan would be able to recognize or visualize the members of the genus and distinguish them from others.

Therefore, given the lack of description of a representative number of compounds, the specification fails to sufficiently describe the claimed invention in such full, clear, concise, and exact terms that a skilled artisan would recognize that appellant was in possession of the claimed invention.

B. Scope of Enablement

Claim(s) 5-6, 9-14, 16-18, 35-36, 39, and 42-43 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a method using a medium having bovine chymosin and *Aspergillus niger* glucoamylase activities and subjecting the medium to a pH of 1.0 to 1.8 to inactivate at least 50% of the glucoamylase activity, while maintaining at least 75% of chymosin activity, does not reasonably provide enablement for methods as broadly encompassed by the claims. The specification does not enable any person skilled in the art to which it pertains, or

with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

"The test of enablement is not whether any experimentation is necessary, but whether, if experimentation is necessary, it is undue." *In re Angstadt*, 537 F.2d 498, 504, 190 USPQ 214, 219 (CCPA 1976). Factors to be considered in determining whether undue experimentation is required are summarized in *In re Wands* (858 F.2d 731, 737, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988)) as follows: (A) The breadth of the claims; (B) The nature of the invention; (C) The state of the prior art; (D) The level of one of ordinary skill; (E) The level of predictability in the art; (F) The amount of direction provided by the inventor; (G) The existence of working examples; and (H) The quantity of experimentation needed to make or use the invention based on the content of the disclosure. See MPEP § 2164.01(a). The Factors most relevant to the instant rejection are addressed in detail below.

*The breadth of the claims*: According to MPEP 2164.04, "[b]efore any analysis of enablement can occur, it is necessary for the examiner to construe the claims...and explicitly set forth the scope of the claim when writing an Office action." Also, MPEP 2164.08 states, "[w]hen analyzing the enabled scope of a claim, the teachings of the specification must not be ignored because claims are to be given their broadest reasonable interpretation that is consistent with the specification."

The claims are drawn to a method using a medium that comprises chymosin activity and glucoamylase activity derived from the cultivation of a bacteria, a yeast, or a

filamentous fungi comprising a gene encoding chymosin that is derived from a bovine or *Camelidae* species. Claim 39 limits the *Camelidae* species to *Camelus dromedarius.*

According to the specification, the claimed method can be applied to "a medium that is derived from the cultivation of a recombinant microorganism that has an inserted gene expressing the aspartic protease" (paragraph bridging pp. 7-8), that the claimed method is applicable to "preparations of aspartic proteases derived from naturally produced aspartic protease by addition or deletion of one or more amino acids or substituting one or more amino acids herein" (specification at p. 8, lines 32-35) and states that the term "aspartic protease" includes pro-chymosin and chymosin (p. 8, line 24). The term "derived" has been interpreted as encompassing a meaning of modified from an original source. As such, the phrase "a gene for encoding chymosin that is derived from a bovine or *Camelidae* species" has been broadly, but reasonably interpreted in light of the specification as meaning a nucleic acid encoding naturally-occurring bovine and *Camelidae* species chymosin as well as mutant and variant forms thereof, wherein the mutant and variant forms are unlimited with respect to structure. This interpretation is undisputed by appellant. Also, it is noted that the a *Camelidae* species encompasses alpaca, llama, vicunas, guanacos, bactrian camel and dromedarian camel.

*The nature of the invention:* As acknowledged by the instant specification, in the production of recombinant chymosin, additional undesired activities are also present in the culture medium, including situations where "the desired product is produced as a fusion protein...and a fusion partner...having...an undesired enzymatic side activity"

(specification at p. 1), wherein the specification discloses the specific embodiment of bovine chymosin fused to *Aspergillus niger* var. *awamori* glucoamylase fusion protein as an example thereof (specification at p. 9, bottom). The invention involves reducing the pH of a culture medium comprising chymosin and glucoamylase to remove unwanted glucoamylase activity, while maintaining chymosin activity.

*The state of the prior art; The level of one of ordinary skill; The level of predictability in the art*: Methods for reducing unwanted side activities in a microbial culture medium by lowering pH were well-known at the time of the invention. See, *e.g.*, Lausten (US Patent 6,080,564, June 2000; cited in the PTO-892 filed on 4/9/02). Also, methods of recombinant production of bovine chymosin using a microbial expression host were well-known at the time of the invention. See, *e.g.*, Lawlis, Jr. et al. (US Patent 5,801,034, particularly column 2, lines 58-64; cited in the PTO-892 filed on 12/11/06) and Ward et al. (*Biotechnol* 8:435-440, abstract; cited in the IDS filed 16 April 2001).

Regarding the *Camelidae* species chymosin gene, it is noted that the prior art fails to disclose such a gene or a method of its making and fails to disclose its activity as a function of pH such that a skilled artisan would expect that it would maintain the recited level of activity following treatment at pH 1.0 to 1.8 as recited in the claims.

Regarding the mutant and variant genes as encompassed by the claims, it is noted that the nucleotide sequence of an encoding nucleic acid determines the corresponding encoded protein's structural and functional properties, including its ability to maintain activity under a given set of conditions, *e.g.*, pH. Predictability of which changes can be tolerated in an encoded protein's amino acid sequence and obtain the

desired activity requires a knowledge of and guidance with regard to which amino acids in the protein's sequence, if any, are tolerant of modification and which are conserved (i.e., expectedly intolerant to modification), and detailed knowledge of the ways in which the proteins' structure relates to its function. The positions within an encoding nucleic acid's sequence where modifications can be made with a reasonable expectation of success in obtaining an encoded polypeptide having the desired activity/utility are limited in any protein and the result of such modifications is highly unpredictable. In addition, one skilled in the art would expect any tolerance to modification for a given protein to diminish with each further and additional modification, e.g. multiple substitutions. The state of the art provides evidence for the high level of unpredictability in altering a polynucleotide sequence with an expectation that the encoded polypeptide will maintain the desired activity/utility. The reference of Branden et al. ("Introduction to Protein Structure", Garland Publishing Inc., New York, 1991; cited in the PTO-892 filed on 3/18/2005) teaches "[p]rotein engineers frequently have been surprised by the range of effects caused by single mutations that they hoped would change only one specific and simple property in enzymes" and "[t]he often surprising results of such experiments reveal how little we know about the rules of protein stability... ...they also serve to emphasize how difficult it is to design *de novo* stable proteins with specific functions" (page 247). See also the teachings of Witkowski et al. (*Biochemistry* 38:11643-11650, 1999; cited in the PTO-892 filed on 3/18/2005), which exemplify the cited teachings of Branden et al. by disclosing that a single amino acid substitution alters the catalytic activity of an enzyme.

*The amount of direction provided by the inventor; The existence of working examples*: The specification discloses an analysis of bovine chymosin and *Aspergillus niger* glucoamylase in an *Aspergillus niger* var. *awamori* culture medium at pH 1.6, 1.7, 1.8, and 5.6 after 21 hours. See Tables 2.1 and 2.2 at pp. 12-13 of the instant specification. The disclosed experimental evidence of Table 2.1 shows that bovine chymosin maintains approximately 87% of its activity at pH 1.6 to 1.8 relative to the activity at pH 5.6 after 21 hours, while Table 2.2 shows that *Aspergillus niger* glucoamylase loses substantial activity at pH 1.6 to 1.8 after 21 hours relative to its activity at pH 5.6.

The specification (and prior art as noted above) fails to disclose even a single working example of a nucleic acid encoding a *Camelidae* chymosin or a method for obtaining such. According to MPEP 2164.01, "[a]ny analysis of whether a particular claim is supported by the disclosure in an application requires a determination of whether that disclosure, when filed, contained sufficient information regarding the subject matter of the claims as to enable one skilled in the pertinent art to make and use the claimed invention," (emphasis added). As noted in MPEP 2164.01(b), The Court in *In re Ghiron*, 442 F.2d 985, 991, 169 USPQ 723, 727 (CCPA 1971), made clear that if the practice of a method requires a particular apparatus, the application must provide a sufficient disclosure of the apparatus if the apparatus is not readily available." In this case, the "apparatus," *i.e.,* a gene encoding a *Camelidae* chymosin gene, does not appear to be readily available and the specification fails to provide a "sufficient disclosure of the apparatus".

Also, the specification fails to provide guidance regarding the effects of pH treatment of any chymosin or glucoamylase, fails to provide guidance regarding alterations to bovine or a *Camelidae* species chymosin that would enable it to maintain at least 75% activity at a pH of 1.0 to 1.8, and fails to provide guidance regarding the use of other glucoamylase polypeptides with an expectation that the activity of the glucoamylase will be inactivated by at least 50% or 90% at a pH of 1.0 to 1.8.

*The quantity of experimentation needed to make or use the invention based on the content of the disclosure*: While methods of making variants of a given polypeptide were known in the art at the time of the invention, e.g., mutagenesis, it was not routine in the art to screen for all genes as encompassed by the claims for those that encode a chymosin polypeptide having the desired activity under the recited conditions.

Thus, in view of the overly broad scope of the claims, the lack of guidance and working examples provided in the specification, the high level of unpredictability, and the significant amount of non-routine experimentation required, undue experimentation would be necessary for a skilled artisan to make and use the entire scope of the claimed invention. As such, appellant has not provided sufficient guidance to enable one of ordinary skill in the art to make and use the claimed invention in a manner reasonably correlated with the scope of the claims. The scope of the claims must bear a reasonable correlation with the scope of enablement (*In re Fisher*, 166 USPQ 19 24 (CCPA 1970)). Without sufficient guidance, determination of having the desired biological characteristics is unpredictable and the experimentation left to those skilled in

the art is unnecessarily, and improperly, extensive and undue. See *In re Wands* 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988).

Rejection under 35 U.S.C. 103(a)

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 5-6, 9, 12-14, 16-18, and 42-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Lawlis, Jr. et al. (US Patent 5,801,034; "Lawlis"; cited in the PTO-892 filed on 12/11/06) and Ward et al. (*Biotechnol* 8:435-440; cited in the IDS filed 16 April 2001; "Ward").

The claims are drawn to a method for reducing glucoamylase activity in a milk clotting composition comprising the steps of: i) providing a medium having a pH of 2.0 or higher, wherein the medium comprises chymosin activity and glucoamylase activity and is derived from the cultivation of an organism selected from a bacterial species, a yeast species, and a species of filamentous fungi, wherein the organism comprises a gene encoding a chymosin derived from a bovine or *Camelidae* species; and ii) subjecting the medium to a pH in the range of 1.0 to 1.8 for a time sufficient to inactivate at least 50% of said glucoamylase activity while maintaining at least 75% of chymosin activity.

The reference of Lawlis teaches, "[i]n the various processes of culturing or fermenting microorganisms, it is sometimes necessary during or at the conclusion of the fermentation process to be able to kill the active cells in the mixture so that the desired product can be recovered from the culture or fermentation mixture. This is particularly true when microorganisms containing recombinant DNA are grown as production hosts and it is desirable to prevent any viable recombinant organisms from being released into the environment" (column 1, lines 18-25). Lawlis teaches, "[i]n the development of this invention, it has been found that the change in pH alone of a fermentation mixture does not accomplish a complete or substantially complete cell kill. For example, in a culture of *Aspergillus niger* for the production of chymosin, reducing the pH to about 2 using sulfuric acid does not accomplish a complete or substantially complete cell kill" (emphasis added; column 2, lines 58-64). To achieve a substantially complete cell kill, Lawlis teaches "selecting a compatible organic acid...adjusting the pH of the culture to a value equal to or less than about 2 pH units below the $pK_a$ of a selected compatible organic acid and adding a sufficient amount of the selected compatible organic acid and/or salt (column 2, lines 29-39). Lawlis expressly teaches acetic acid, propionic acid, and formic acid as being used in the claimed method (see claim 2) and further teaches "if formic acid ($pK_a$ =3.75) is to be used to accomplish the cell kill, the pH of the mixture will be adjusted with a mineral acid to about 1.75 or less, then formic acid is added to accomplish the cell kill" (column 3, lines 51-60). See also claims 2 and 3 of Lawlis, which specifically recites the use of formic acid and sulfuric acid, respectively, in the disclosed method. The working examples of Lawlis, although using acetic acid and not

formic acid, teach that "substantially complete cell kill" can be achieved by overnight incubation (Example 1), a 60 hour incubation (Example 2), and a 4 hour incubation (Example III). Although Lawlis teaches the method be applied to a culture of *Aspergillus niger* for the production of chymosin (column 2, lines 58-64) and also specifically teaches adjusting the pH the of the mixture with a mineral acid to about 1.75 or less when formic acid is the selected organic acid (column 3, lines 51-60), Lawlis does not expressly teach adjusting a medium comprising *bovine or Camelidae* chymosin *and glucoamylase* activities to a pH in the range of 1.0 to 1.8.

The reference of Ward teaches *Aspergillus niger* var. *awamori* comprises a gene encoding a glucoamylase polypeptide (p. 435, column 1, bottom; column 2, middle; and p. 437, column 2, top) and further teaches the use of an expression vector in which the cDNA encoding a bovine prochymosin B polypeptide was fused in frame immediately following the codon for the last amino acid of *Aspergillus niger* var. *awamori* glucoamylase gene and recombinant production of chymosin in *A. niger* var. *awamori* transformed with this vector "led to the secretion of considerably higher amounts of chymosin than obtained with previous chymosin vectors" (p. 435, left column, abstract). See also p. 437, right column, Table 2. According to Ward, the *A. niger* var. *awamori* medium comprising the secreted fusion exhibited chymosin activity and glucoamylase activity (p. 437, right column, Table 2).

Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to combine the teachings of Lawlis and Ward to use a culture of the transformant of Ward in a method of Lawlis, namely, treating the culture with sulfuric

acid to a pH of 1.75 and then adding formic acid to effect substantial cell kill. One would have been motivated to use the transformant of Ward in the method of Lawlis because the transformant of Ward produces "considerably higher amounts of chymosin." One would have had a reasonable expectation of success for using the culture of Ward in the method of Lawlis because of the teachings of Lawlis and Ward. Therefore, claims 5-6, 9, 12-14, 16-18, and 42-43, drawn to the method as noted above would have been obvious to one of ordinary skill in the art at the time of the invention.

The following comments are provided to clarify the instant rejection, particularly with respect to the limitation of "subjecting said medium...for a period of time sufficient to inactivate at least 50% of said glucoamylase activity while maintaining at least 75% of said chymosin activity" in claim 9. According to MPEP 2111.01.I, "'[c]laims are not to be read in a vacuum, and limitations therein are to be interpreted in light of the specification in giving them their broadest reasonable interpretation'". Thus, although claim 9 does not specifically delineate the recited "period of time", the examiner has referred to the specification and claims to ascertain the intended "period of time" as encompassed by the claims. According to the specification at p. 7, lines 21-23, "[t]ypically...the required treatment period is within the range of 0.1 minutes to 48 hours", which is as few as 6 seconds up to 48 hours. See also the limitations of claim 18, which limit the "period of time" in claim 9 to between 0.1 minutes to 48 hours. Accordingly, the examiner has interpreted the "period of time" to inactivate at least 50% or 90% of the glucoamylase activity, while maintaining at least 75% or 85% of the chymosin activity as being

inclusive of 0.6 seconds up to 48 hours. Appellant has yet to dispute the examiner's noted interpretation of the claims.

According to MPEP 2112, "[t]he express, implicit, and inherent disclosures of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. 102 or 103. 'The inherent teaching of a prior art reference, a question of fact, arises both in the context of anticipation and obviousness'". MPEP 2112.I states, "'[t]he discovery of a previously unappreciated property of a prior art composition, or of a scientific explanation for the prior art's functioning, does not render the old composition patentably new to the discoverer". MPEP 2112.IV states, "'To establish inherency, the extrinsic evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill". While it is acknowledged that the combination of references fails to *expressly* teach inactivation of at least 50% or 90% of the glucoamylase activity, while maintaining at least 75% or 85% of the chymosin activity, this would be a necessary feature of practicing the method of Lawlis with a culture medium of the transformant of Ward producing a glucoamylase-chymosin fusion protein, particularly as Lawlis expressly teaches treating a culture medium at a pH of 1.75 with overnight incubation or incubation for 4 hours, which pH and time are either specifically recited and/or disclosed in the specification to achieve the desired reduction in glucoamylase activity while maintaining the desired level of chymosin activity. Thus, although the prior art does not *expressly* teach the noted limitation, since the pH and time of the prior art method are encompassed by the "period of time", practicing the prior art method would

appear to necessarily result in the inactivation of at least 50% or 90% of the glucoamylase activity, while maintaining at least 75% or 85% of the chymosin activity as required by the claims.

**(10) Response to Argument**

Rejections under 35 U.S.C. 112, first paragraph

A. Written Description

Beginning at p. 3, bottom of the Appeal Brief filed on 11/2/07 ("Brief"), appellant addresses the written description rejection by noting the salient feature(s) of the claimed invention that lacks adequate description, *i.e.*, the genus of genes encoding chymosin that derived from a bovine or *Camelidae* species, optionally wherein the *Camelidae* species is limited to *Camelus dromedarius*. Appellant cites various MPEP sections and case law relevant to the written description requirement according to 35 U.S.C. 112, first paragraph.

Beginning at p. 5, bottom of the Brief, appellant argues that while the claims recite bovine or *Camelidae* species, the claims are not directed to "an organism [that]...comprises a gene" as recited by claim 9, but recite additional process steps and when considered as a whole, it would be recognized that appellant was in possession of the claimed invention. According to appellant, the claims are not directed to recombinant organisms but to methods of use thereof, and the same level of disclosure is not required for the methods as would be for the recombinant microorganisms themselves. Appellant argues that the examiner has analyzed the claims as though they were drawn to the organisms themselves, without addressing the specific method steps

of the claimed invention in the written description analysis. Appellant argues that additional disclosure is not required to satisfy the requirements for adequate written description.

Appellant's argument is not found persuasive. Contrary to appellant's position, the examiner has considered the claims *as a whole* in the written description analysis. Indeed, MPEP 2163.II.A.1, in setting forth the methodology for determining adequacy of written description, directs the examiner to "determine what the claim as a whole covers". While the examiner acknowledges the rejection focuses on the description of the genus of recited genes, this is merely in accordance with MPEP 2163.III.A.(A), which directs the examiner in rejecting a claim for lack of adequate written description to "Identify the claim limitation at issue". By pointing to the genus of genes as recited in claim 9, the examiner has identified the claim limitation at issue and addressed it accordingly.

The examiner acknowledges that the claims are not drawn to organisms *per se*, but to methods of use thereof. In this case, the recited organism comprising a genus of genes is a critical and essential element of the claimed invention. However, this distinction would not appear to differentiate the standard for a product claim as compared to a method claim, which uses that product. According to MPEP 2163.A.I, "The claimed invention as a whole may not be adequately described if the claims require an essential or critical feature which is not adequately described in the specification and which is not conventional in the art or known to one of ordinary skill in the art". The Court addressed a similar argument in *University of Rochester v. G.D.*

*Searle & Co.*, 69 USPQ2d 1886 (Fed. Cir. 2004). The *Rochester* Court found this difference to be a "semantic distinction" and held that "Regardless whether a compound is claimed per se or a method is claimed that entails the use of the compound, the inventor cannot lay claim to that subject matter unless he can provide a description of the compound sufficient to distinguish infringing compounds from non-infringing compounds, or infringing methods from non-infringing methods. As the district court observed, '[t]he claimed method depends upon finding a compound that selectively inhibits PGHS-2 activity. Without such a compound, it is impossible to practice the claimed method of treatment.'"

At least for the reasons noted above, it is the examiner's position that the specification fails to sufficiently describe the claimed invention in such full, clear, concise, and exact terms that a skilled artisan would recognize that appellant was in possession of the claimed invention.

B. Scope of Enablement

Beginning at p. 7, top of the Brief, appellant addresses the scope of enablement rejection, citing sections of United States code and MPEP relevant to the enablement requirement according to 35 U.S.C. 112, first paragraph.

Beginning at p. 7, middle of the Brief, appellant argues the rejection fails to properly consider the scope of the claims because "there is no need to actually make every possible starting material in order to practice the invention as the specification teaches that the simple steps of the invention may be applied to chymosin compositions

having undesired enzymatic activity". According to appellant, the examiner has ignored the state of the art regarding recombinant chymosin production such as that disclosed by Ward (*supra*).

Appellant's argument is not found persuasive. The examiner acknowledges that there is no need to make and disclose every permutation of the claimed invention in order to demonstrate the specification enables the full scope of the claimed invention. As noted by MPEP 2164.01(b), "As long as the specification discloses at least one method for making and using the claimed invention that bears a reasonable correlation to the entire scope of the claim, then the enablement requirement of 35 U.S.C. 112 is satisfied". The specification teaches "at least one method for making and using the claimed invention", *i.e.,* treatment of an *Aspergillus niger* var. *awamori* culture medium comprising bovine chymosin and *Aspergillus niger* glucoamylase at pH 1.6, 1.7, and 1.8 for 21 hours. However, for reasons noted above in the analysis of the Factors of *In re Wands,* it is the examiner's position that this working example fails to "bear[] a reasonable correlation to the entire scope of the claim".

The examiner disagrees with appellant's assertion that the examiner has ignored the state of the art of recombinant chymosin production. The examiner has considered the state of the art of recombinant chymosin production and there is no dispute that methods for recombinant production of bovine chymosin were known in the prior art at the time of the invention. If appellant is implying that since recombinant chymosin production methods were known in the art at the time of the invention, this is evidence of an enabling disclosure, it is noted that just as it is improper for an examiner

to conclude that "a disclosure is not enabling based on an analysis of only one of the [*Wands*] factors while ignoring one or more of the others" (MPEP 2164.01(a)), so it would appear to be improper to conclude that a specification *is* enabling based on an analysis of only one of the Factors of *In re Wands*. According to MPEP 2164.08, "'the specification must teach those skilled in the art how to make and use the full scope of the claimed invention without undue experimentation'" (emphasis added). The issue at hand is whether or not the full scope of the claimed invention is enabled by the specification, particularly with respect to the "organism...compris[ing] a gene for encoding chymosin that is derived from a bovine or *Camelidae* species" that is required to practice the claimed methods.

Beginning at p. 8, middle of the Brief, appellant argues that while the claims recite bovine or *Camelidae* species, the claims are not directed to "an organism [that]...comprises a gene" as recited by claim 9, but recite additional process steps and when considered as a whole, it would be recognized that the specification enables the full scope of the claimed invention. According to appellant, the claims are not directed to recombinant organisms but to methods of use thereof, and the same level of disclosure is not required for the methods as would be for the recombinant microorganisms themselves. Appellant argues that the examiner has analyzed the claims as though they were drawn to the organisms themselves, without addressing the specific method steps of the claimed invention in the written description analysis. Appellant argues that additional disclosure is not required to satisfy the requirements for adequate written description.

Appellant's argument is not found persuasive. Contrary to appellant's position, the examiner has considered the claims *as a whole* in the enablement analysis. Indeed, MPEP 2164.08 in setting forth the methodology for determining enablement, states, "The examiner should determine what each claim recites and what the subject matter is when the claim is considered as a whole, not when its parts are analyzed individually". While the examiner acknowledges the instant rejection focuses on the recited genes, the examiner has considered the claimed invention *as a whole,* and, in the interest of brevity, the examiner has limited the analysis to the salient issue at hand.

The examiner acknowledges that the claims are not drawn to organisms *per se*, but to methods of use thereof. However, this distinction would not appear to differentiate the standard of enablement for a product claim as compared to a method claim, which uses that product. As noted above, MPEP 2164.08 states, "'the specification must teach those skilled in the art how to make and use the full scope of the claimed invention without undue experimentation'" (emphasis added). As such, while the specification need not exemplify all embodiments as encompassed by the claims, the specification should nonetheless enable the full scope of the claimed invention.

At least for the reasons noted above, it is the examiner's position that the specification fails to enable the full scope of the claimed invention.

Rejection under 35 U.S.C. 103(a)

Beginning at p. 9 of the Brief, appellant discusses various requirements for establishing a *prima facie* case of obviousness.

Beginning at p. 10, middle of the Brief, appellant attacks the reference of Lawlis, noting that Lawlis does not teach: 1) a medium derived from the cultivation of an organism comprising a gene encoding bovine or *Camelidae* chymosin; or 2) inactivating at least 50% of said glucoamylase activity while maintaining at least 75% of said chymosin activity".

Appellant's argument is not found persuasive. The examiner acknowledges that Lawlis does not *expressly* teach the limitations as noted above. However, in response to appellant's arguments solely against Lawlis, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). In this case, it is the *combination* of references that is relied upon by the examiner to establish a *prima facie* case of obviousness. As noted above, the reference of Ward teaches a medium of an *Aspergillus awamori* transformant having glucoamylase activity from both endogenously-produced glucoamylase and glucoamylase activity from the glucoamylase-chymosin fusion protein. Further, even though the combination does not expressly teach inactivating at least 50% of said glucoamylase activity while maintaining at least 75% of said chymosin activity, the method suggested by the combination of prior art would necessarily have this result as noted above.

Beginning at p. 11, middle of the Brief, appellant argues that in order for a *prima facie* case of obviousness to be established, one must: 1) modify the medium of Lawlis so that glucoamylase activity is present; and 2) select a non-preferred organic acid

"such a [sic] lactic acid that happens to have a pKa below 4.0". Appellant argues that since "various modifications" must be made to the prior art of Lawlis, Lawlis does not inherently teach inactivating at least 50% of said glucoamylase activity while maintaining at least 75% of said chymosin activity.

Appellant's argument is not found persuasive. The examiner acknowledges that Lawlis does not explicitly teach the *Aspergillus niger* var. *awamori* medium comprises glucoamylase. However, there is no requirement that all limitations be taught by a single reference in a rejection based on an inherency rationale. Put another way, there is no requirement that excludes a combination of references being used in a rejection based on an inherency rationale. To the contrary, MPEP 2112 makes clear that "[t]he express, implicit, and inherent disclosures of a prior art reference may be relied upon in the rejection of claims under 35 U.S.C. 102 or 103. 'The inherent teaching of a prior art reference, a question of fact, arises both in the context of anticipation and obviousness.'"

Moreover, while it is acknowledged that Lawlis teaches "[i]n a preferred embodiment...acetic acid is particularly useful in killing cells in fermentation processes" (column 4, lines 54-56), Lawlis does not teach away from or exclude the use of formic acid in the disclosed method and specifically discloses and claims formic acid as an embodiment of an acid that can be used to achieve cell kill for "a culture of *Aspergillus niger* for the production of chymosin", particularly as Lawlis teaches "reducing the pH to about 2 using sulfuric acid does not accomplish a complete or substantially complete cell kill". Also, while Lawlis may disclose acetic acid as a preferred embodiment, Lawlis

recognizes that acetic acid is not to be used exclusively, disclosing "Other effective acids can be used depending on the cell cultures involved and the economics of the process" (column 4, lines 49-53). According to MPEP 2123, "A reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill the art, including nonpreferred embodiments" and according to MPEP 2123.II, "[d]isclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments..." Also, even though Lawlis discloses propionic acid and acetic acid as alternatives to formic acid (see claim 2), according to MPEP 2123.II, "[t]he prior art's mere disclosure of more than one alternative does not constitute a teaching away from any of these alternatives because such disclosure does not criticize, discredit, or otherwise discourage the solution claimed...."

Further, the examiner acknowledges that "'Inherency...may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.'" MPEP 2112.IV. However, the instant rejection is not based on "probabilities or possibilities", and, for reasons presented in detail above, is instead based on "fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art".

Beginning at p. 11, bottom of the Brief, appellant characterizes the rationale for combining Ward with Lawlis and further presents certain teachings of the reference of Ward, which describe the conversion of the fusion protein to mature chymosin.

Beginning at p. 12, bottom of the Brief, appellant argues that it is only through hindsight that one of ordinary skill in the art would select a non-preferred organic acid of Lawlis and combine it with Ward. Appellant further argues that "none of the cited references teach that substantial chymosin activity can be maintained below a pH of 2.0, which is only taught by [appellant's] own disclosure".

Appellant's argument is not found persuasive. Regarding appellant's allegation of hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the appellant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). As noted above, the combination of references does not teach away from or exclude the use of formic acid in the disclosed method and specifically discloses and claims formic acid as an embodiment of an acid that can be used to achieve cell kill for "a culture of *Aspergillus niger* for the production of chymosin", particularly as Lawlis teaches "reducing the pH to about 2 using sulfuric acid does not accomplish a complete or substantially complete cell kill". Also, while Lawlis may disclose acetic acid as a preferred embodiment, Lawlis recognizes that acetic acid is not intended as the only acid to be used in the claimed method by disclosing "Other effective acids can be used depending on the cell cultures involved and the economics of the process" (column 4, lines 49-53). According to MPEP 2123, "A reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill

the art, including nonpreferred embodiments" and according to MPEP 2123.II, "[d]isclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments..." Also, even though Lawlis discloses propionic acid and acetic acid as alternatives to formic acid (see claim 2), according to MPEP 2123.II, "[t]he prior art's mere disclosure of more than one alternative does not constitute a teaching away from any of these alternatives because such disclosure does not criticize, discredit, or otherwise discourage the solution claimed...."

Beginning at p. 13, top of the Brief, appellant argues that unexpected results should be considered in an obviousness analysis. According to appellant, "Prior to the present invention, the removal of unwanted side activity in chymosin preparations often involved complicated phase-separation and chromatographic processes...None of the references discussed or cited by the examiner discuss reduction of glucoamylase activity utilizing changes in pH. Moreover, none of the cited references teach that this can be accomplished without destroying the chymosin activity. The examiner improperly side-steps consideration of unexpected results by stating that they are 'an inherent result of practicing the method suggested by the prior art.'...However, it is improper to disregard unexpected results in this manner, especially where as here there is no showing that the unexpected results would have been recognized or appreciated by a person having ordinary skill in the art at the time of the invention".

Appellant's argument is not found persuasive. The examiner acknowledges appellant's *allegation* of unexpected results. Appellant's experimental evidence of Table

2.1 at p. 12 of the specification shows that bovine chymosin maintains approximately 87% of its activity at pH 1.6 to 1.8 relative to the activity at pH 5.6 after 21 hours, while Table 2.2 shows that *Aspergillus niger* glucoamylase loses substantial activity under the same conditions. While the examiner does not dispute the experimental results of Tables 2.1 and 2.2, it is the examiner's position that appellant has failed to establish that the differences in results are unexpected and unobvious and of both statistical and practical significance as required by MPEP 716.02(b). According to the Brief, the alleged unexpected results are "lowering the pH to a specified range, glucoamylase side activity is unexpectedly reduced while chymosin activity is maintained in significant quantities". Brief at p. 4, lines 6-8. The "specified range" appears to be that recited in the claim, *i.e.,* "a pH in the range of 1.0 to 1.8". However, it would appear that appellant has not met the burden for establishing the results are indeed unexpected. For example, appellant's data fails to compare the Tables 2.1 and 2.2 results at pH 1.6, 1.7, and 1.8 with the prior art of Ward, which teaches treating an *Aspergillus niger* var. *awamori* culture medium comprising a glucoamylase-bovine chymosin fusion protein at pH 2.0 for 30 minutes. Without such a comparison, there is no basis for which to determine whether or not the results of Tables 2.1 and 2.2 of the specification are truly unexpected. See MPEP 716.02(d).II, which states, "To establish unexpected results over a claimed range, applicants should compare a sufficient number of tests both inside and outside the claimed range to show the criticality of the claimed range". As such, appellant has failed to establish that the results are unexpected and significant.

Even assuming *arguendo* such a comparison were available, it is the examiner's position that these results would not necessarily be unexpected to one of ordinary skill in the art at the time of the invention. As to the Table 2.1 results, it is noted that bovine chymosin is well-known in the art as being a digestive enzyme, is processed from an inactive form to an active form at pH 2, and has optimum pH for activity at about pH 3.5. See Foltmann (*Biochem J.* 115:3P-4P, 1969; cited in the PTO-892 filed on 5/31/06). The prior art even acknowledges treatment of a composition comprising chymosin to a pH as low as 0.5 for extracting catalytically active chymosin as evidenced by Larsen (WO 95/29999; cited in the IDS filed on 4/16/01; see particularly p. 10). As such, one of ordinary skill in the art would reasonably expect bovine chymosin to maintain activity at low pH, even as low as pH 0.5.

As to glucoamylase, it is acknowledged that neither Lawlis nor Ward discloses the activity of *Aspergillus niger* var. *awamori* glucoamylase in a culture of *Aspergillus niger* var. *awamori* as a function of pH. However, it is well-known in the prior art that enzymes favor a certain pH for optimal activity, *i.e.,* the enzymes have higher activity at a particular pH, with decreased activity occurring outside of that preferred pH. See, for example, the reference of Foltmann (*Biochem J.* 115:3P-4P, 1969; cited in the PTO-892 filed on 5/31/06), which discloses an analysis of chymosin activity as a function of pH, where mature chymosin is disclosed as having an optimum pH at "about 3.5" (p. 4P). Thus, it appears that appellant's alleged "unexpected results" are merely a characterization of the pH profile of *Aspergillus niger* var. *awamori* glucoamylase at the noted pH values after 21 hours in a *Aspergillus niger* var. *awamori* fermentation

medium. However, as noted above, Ward teaches glucoamylase is endogenously produced by *Aspergillus niger* and Lawlis suggests treating "a culture of *Aspergillus niger* for the production of chymosin" at pH 1.75 for a time sufficient to effect cell kill, which is noted in Lawlis as overnight incubation (Example 1), a 60 hour incubation (Example 2), and a 4 hour incubation. As such, instead of an unexpected result, it appears that appellant has "discovered" a previously unappreciated property of a culture medium of *Aspergillus niger* comprising chymosin and glucoamylase treated at low pH, *e.g.,* pH 1.75, wherein such medium is taught by Lawlis. According to MPEP 2112.I, "'[t]he discovery of a previously unappreciated property of a prior art composition, or of a scientific explanation for the prior art's functioning, does not render the old composition patentably new to the discoverer'".

Even assuming *arguendo* the results presented in the specification are truly unexpected, it is noted that the alleged unexpected results are not commensurate in scope with the claimed invention as required by MPEP 716.02(d). As noted above, appellant's experimental evidence of Table 2.1 at p. 12 of the specification shows that bovine chymosin maintains approximately 87% of its activity at pH 1.6 to 1.8 relative to the activity at pH 5.6 after 21 hours, while Table 2.2 shows that *Aspergillus niger* glucoamylase from a culture of *Aspergillus niger* var. *awamori* loses substantial activity under the same conditions. According to MPEP 716.02(d), "Whether the unexpected results are the result of unexpectedly improved results or a property not taught by the prior art, the 'objective evidence of nonobviousness must be commensurate in scope with the claims which the evidence is offered to support.'" However, in this case, the

claimed invention is not commensurate in scope with the experimental evidence for at least the reasons that: 1) the recited medium can be from any bacteria, yeast, or filamentous fungi, while the experimental medium is a culture medium of *Aspergillus niger* var. *awamori*; 2) the claims encompass chymosin from the genus *Camelidae,* while the experiments use only bovine chymosin; 3) the chymosin is unlimited with respect to structure, encompassing mutants and variants, while the experiments use only bovine chymosin; 4) the glucoamylase is unlimited with respect to source, while the experiments use only *Aspergillus niger* glucoamylase; 5) the claims encompass any "period of time sufficient to inactivate 50% of said glucoamylase activity while maintaining at least 75% of said chymosin activity", while the experiments use a time period of 21 hours; and 6) the recited percentage remaining activity of glucoamylase and chymosin following treatment at pH 1.0 to 1.8 is compared to the respective activity at any pH of 2.0 or higher, while the experiments require the percentage remaining activity of glucoamylase and chymosin following treatment at pH 1.6, 1.7, and 1.8 to being compared to the respective activity at pH 5.6. In view of these differences in scope between the claimed invention and the experimental evidence, one of ordinary skill in the art would recognize that the experimental evidence does not provide an adequate basis for concluding that similar results would be obtained for any and all embodiments as encompassed by the claimed invention.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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